

**SOME MARINE FREELIVING NEMATODES FROM THE
AUSTRALIAN COAST**

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SUMMARY

The following nematodes have been identified from dredgings off the coast of New South Wales (locality indicated as N.S.W.), from St. Vincent Gulf (Port Willunga and Port River), and from Pennington Bay, Kangaroo Island (Penn. B.) :—

Anticomopsis gibbonensis n. sp. (N.S.W.); *Thoracostoma australe* n. sp. (N.S.W.); *Enoplus meridionalis* Steiner (Port Willunga); *Metoncholaimus pristiurus* Z. Strassen (Pt. River); *Pontonema hackingensis* n. sp. (N.S.W.); *Symplocostoma longicolle* Bastian (Penn. B.); *Symplocostomella johnstoni* n. sp. (N.S.W.); *Mesacanthion gracilisetosus* Allgen (N.S.W.); *Harveyjohnstonia kartanum* n. g., n. sp. (Penn. B.).

The work done on Australian freeliving nematodes up to the present has been summarised by the late Professor Harvey Johnston in his Census of 1938.

The subject matter of this paper was recommended to the author by Professor Johnston a short time before his death. Unfortunately he was unable to read the manuscript, so the classification used and conclusions reached are the author's sole responsibility. The labour of identification was greatly lightened by the use of Professor Johnston's personally compiled septemmatic catalogue on nematodes as well as his catalogue of authors. It is with gratitude to Professor Johnston and his family that we acknowledge the gift of this valuable collection to the University of Adelaide.

The material examined comprised three collections :

- (1) from dredgings off the New South Wales coast by the C.S.I.R.O. Research Vessel "Warreen"; this collection was kindly forwarded to us by Mr. K. Sheard of the Fisheries Division;
- (2) littoral forms collected in St. Vincent Gulf by Professor Johnston; and
- (3) littoral forms collected at Pennington Bay, Kangaroo Island, by my colleague, Mr. S. J. Edmonds. These were present in surface scrapings from the rock around a sandy pool, where there was very little vegetation.

***Anticomopsis gibbonensis* n. sp.**

Fig. 1-2

Four males and one female were taken from a collection dredged five miles east of Port Gibbon, New South Wales. They are long slender worms tapering in the oesophageal region; the tail is conical, ending in a suddenly narrowed tip. The cuticle is smooth, somatic setae few and scattered. The head bears three well-defined lips. Six cephalic papillae surround the mouth and ten cephalic setae lie on a ring 15μ behind the anterior end, the setae being to 20μ long, i.e., two-fifths of the width of the head at that level. The amphid is indistinct. Cervical setae in two groups of four in each lie 50μ from head end. Buccal capsule absent. Oesophagus of even diameter throughout, at its posterior end its width is about one-ninth that of body at same level.

No ripe eggs are present in the female. The ovaries are divergent and reflexed.

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The male tail and spicules are of the typical form in the genus.

♀ : L = 10.3 mm. $\alpha = 43$, $\beta = 7.3$; $\gamma = 50$

Cobb: —; 4.5; 13.6; 58.2; 98
 —; 1.0; 2.2; 2.3; .97

♂ : L = 10.3 mm. (9.8—11.2); $\alpha = 50$, $\beta = 6$; $\gamma = 45$.

Cobb: —; 4.2; 16.6; M; 98
 —; 1.0; 1.8; 2.0; 1.2

This species differs from *A. typicus* Micol., in the position of the vulva, the α , β and γ proportions, and in the total length of the worms.

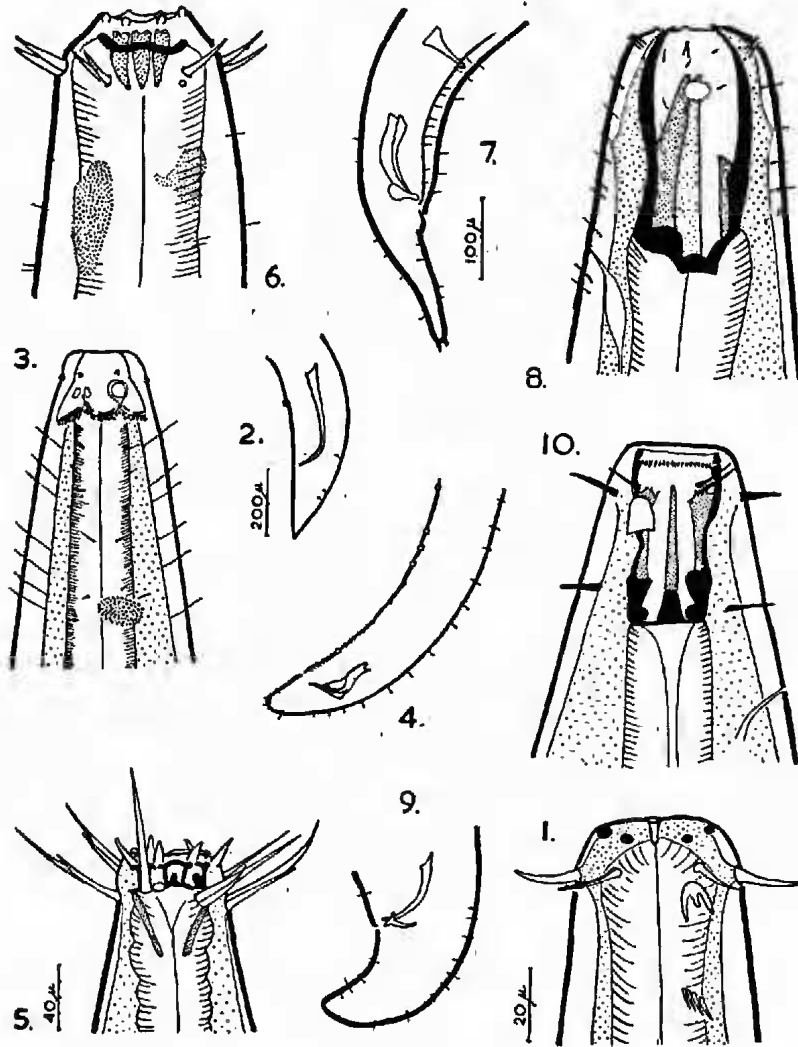


Fig. 1-10

Fig. 1-2, *Anticomopsis gibbonensis*: 1, head of male; 2, male tail. Fig. 3-4, *Thoracostoma australe*: 3, head; 4, male tail. Fig. 5, *Mesacanthion gracilisetosus*: head. Fig. 6-7, *Enoplus communis*, var. *meridionalis*: 6, head; 7, male tail. Fig. 8-9, *Pontonema hackingensis*: 8, head; 9, male tail. Fig. 10, *Symplocostomella johnstoni*: head. Fig. 1, 6, and 10 to same scale; fig. 3, 5, and 8; fig. 4, 7, 9.

Thoracostoma australe n. sp.

Fig. 3-4

This species was taken from three dredging stations off New South Wales coast: (1) 5 miles east of Port Gibbon; (2) 4 miles off Port Hacking, at 80 M.; (3) off Wata Muri at 75 M.

Relatively large worms, tapering in oesophageal region, rest of body almost cylindrical; tail short and rounded. Diameter at level of short cephalic setae is 47-50 μ , at level of ocelli 90-100 μ , at nerve ring 15-17 mm., at base of oesophagus 2-23 mm., and at widest part of body 23-27 mm.

Cephalic armature is more or less imperforate except near posterior edge where slit-like pores appear irregularly parallel to the margin. Just posterior to the margin is a row of small refractive bodies as described by Ditlevsen for *T. campbelli*. The ocelli are 15-2 mm., and the nerve ring 65-7 mm. from the head. The oesophagus widens slightly for the posterior third of its length.

Male—Spicules are 23 mm. long, gubernaculum 80 μ long. Tail at anus is as wide as its length, 14-16 mm. On male tail are five pairs of adanal setae, and six pairs of subterminal, as well as irregular dorsal setae. Preanally are two rows of numerous setae, which are more scattered as distance from anus increases; about 1 mm. in front of anus is a well-developed median preanal papillate organ and anterior to this eight pairs of papillae, successively less well developed.

Female—Vulva is just posterior to mid-length of body, 53-58% of body length from head. At most there are three ova to each oviduct. In 12.5 mm. worm, G1 = 15.2% + (8.5%), G2 = 19.2% + (10.4%). Well-developed ova are 700 μ by 200 μ . In the female the tail is sometimes slightly longer than the anal width.

$$\text{♀: } L = 12.5-17 \text{ mm.}; \quad \alpha = 54.3-63; \quad \beta = 6 - 7.1; \quad \gamma = 63 - 69.9 \\ V = 51.54\%$$

$$\text{♂: } L = 11.8 - 15.4 \text{ mm.}; \quad \alpha = 51.3-56.3; \quad \beta = 5.9-6.3; \quad \gamma = 90.8-96$$

This species is close to *T. campbelli* Ditlevsen in the structure of the cephalic helmet. It differs in the position of the vulva, the shape of the oesophagus, and the position of the eyes.

MESACANTHION GRACILISETOSUS Allgen 1930

(Fig. 5)

Two female specimens, one very immature, referable to *Mesacanthion gracilesetosus* Allgen, were taken from 75 M. off Wata Muri, New South Wales coast.

$$L = 4-6 \text{ mm.}; \quad \alpha = 36.6; \quad \beta = 4.6; \quad \gamma = 11.5; \quad A-V = 54\%$$

The measurements and general description agree with that of Allgen 1930 (p. 189-191) of male and females from Macquarie Island.

ENOPLUS COMMUNIS var. MERIDIONALIS Steiner 1921

(Fig. 6-7)

From rock scrapings in sublittoral fringe, Port Willunga, South Australia. Material consists of two males, two females and five juveniles. The proportions given below and appearance agree with Steiner's account of *E. communis* var. *meridionalis*. They differ from *E. communis* Eberth in (1) body length; (2) α and γ values; (3) relation between length of spicules and distance between cloaca and accessory organ. The body diameter is relatively greater than that given by Steiner; a low α value, however, has been recorded by Chitwood (1936) for the sub-species.

♂ : L = 2.3-2.5 mm.; a = 18.5; β = 6; γ = 14
 ♀ : L = 2.4-2.6 mm.; a = 16; β = 6; γ = 12.5; V: 57.7-58.3%
 Juv.: L = 1.1-1.8 mm.

The position of this subspecies has been somewhat confused by Stekhoven, by whom it was stated in 1933 (Coninck and Stekhoven, p. 32) to be a synonym of *E. striatus* Eberth, but in 1950 (p. 337) and 1943 (p. 49) given specific status. In his redescription of *E. meridionalis* from material collected in Villefranche, Stekhoven describes the male accessory organ as tubular, lying "immediately" in front of the proximal end of the spicule. Steiner describes and figures a trumpet-shaped accessory organ which lies some distance in front of proximal end of spicule. Measured on his figure it is one and a half times spicule length from anus. In addition, the median ventral papilla at mid-length of the "tail," described as outstanding by Steiner, is not figured or mentioned by Stekhoven. It is obvious that Stekhoven's material is not *E. meridionalis* Steiner.

Chitwood (1936, 208) recorded the subspecies from Beaufort, U.S.A.; in his figures, the accessory piece, somewhat enlarged at its proximal end, lies one and a half times the spicule length in front of the anus; in addition he figures a median ventral prominence on the tail at about its mid-length. Allgen (1947, 101) recorded the species from California; his figure shows a trumpet-shaped accessory piece one and three-quarter times the spicule length in front of the anus.

Eberth's work of 1863 being inaccessible, the present author is unable to compare the South Australian material with *E. striatus*.

METONCHOLAIMUS PRISTIURUS (Z. Strassen)

This species is apparently common in the Port River; many specimens were taken from mud near the Jervois Bridge, and the species appears on experimental subtidal plates at a station nearby. Our specimens agree in morphology with the description given by Cobb 1932, and with that of Stekhoven and Adam (1931, 23-24) (for *M. denticaudatus* S. and A., which Coninck and Stekhoven (1933-55) recognise as a synonym of *M. pristiurus*).

The measurements presented in formulae in the two papers differ very slightly and those given below for the South Australian specimens are close to them, though the oesophagus is apparently rather shorter.

According to Cobb, stagnant marine mud is a common habitat for the species.

♂ : L = 5.8-6.5 mm.; a = 61; β = 10.9; γ = 26.2
 Cobb: 0.58 0.47 9.4 M 96.1
 ————— = 6.03 mm.
 0.7 1.2 1.3 1.6 0.7
 ♀ : L = 6.1-6.5 mm.; a = 63; β = 11.5; γ = 25.2; Vulva: 70.9%
 Cobb: 0.6 ? 9.4 70.9 91.2 (d M pore) 96.0
 ————— = 6.3
 0.7 ? 1.3 1.4 — 0.7

Pontonema hackingi n. sp.

(Fig. 8-9)

Four specimens, three females and one male, were in two collections taken off Port Hacking.

♀ : L = 8.7-11 mm.; a = 35-35.5; β = 6.7-8; γ = 58; A-V = 56.3-57%

♂ : L = 11.3 mm.; a = 36.4 β = 8; γ = 66.4

Cuticle with numerous short setae, arranged roughly in six rows. Ten cephalic setae, about one-eighth to one-ninth head width. Six small oral papillae.

Buccal capsule about half as wide as long, $60\mu \times 120-130\mu$, heavily chitinised, slightly wider anteriorly in dorso-ventral direction. Ventral teeth reach a point 26μ from anterior end of buccal capsule, i.e., three-quarter length of buccal capsule from its floor. The small almost circular amphid, one-seventh diameter of head at that level, lies at about the level of the tips of subventral teeth.

Oesophagus cylindrical; nerve ring 5.57 mm. from anterior end of worm. Excretory pore just posterior to buccal capsule.

Female—Vulva just behind midbody; eggs, with their shell, $200\mu \times 250\mu$.

Male—Spicules 130μ long, acicular, equal in length to anal breadth; gubernaculum 55μ long, with paired anterior projections near tip. Several pairs of ventral papillae preanally, from 15 mm. in front of anus to about 5 mm. in front.

The species lies close to *P. papilliferus* (Filipjev), differing mainly in the length of the male tail and in the absence of a preanal cushion of setae.

Symplocostomella johnstoni n.sp.

Fig. 10

Taken in trawl at (? 200 M) 5 miles east of Point Gibbon on New South Wales coast near Port Hacking. Only two females present, one ovigerous; their lengths are 8.6 mm. and 10.1 mm. respectively. Measurements given below are of the latter, although the submedian view of head in fig. 12 is of the younger female

L: 10.1 mm.; $a = 3.7$; $\beta = 7$; $\gamma = 33.6$. Vulva = 58.5% .

Head truncated; ten large setae, all 15μ long, lie 11μ behind the anterior end. Amphids lie directly behind lateral setae, their diameter one-sixth diameter of head at that level.

Buccal capsule is 46μ deep, its internal diameter varying slightly at different levels, generally about 20μ . One subventral tooth, larger than the others, is stout and pointed, and arises from the base of the buccal capsule, against the wall; the other two teeth are more slightly built, and each arises from a "cushion" projecting from the lower part of the buccal capsule wall. These two teeth project into the cavity as slender outgrowths terminating in widened serrated ends.

The excretory pore lies shortly behind the buccal capsule, 60μ from the anterior end. The oesophagus widens in its second half. The cuticle anteriorly bears scattered long thin setae.

The tail is 3 mm. long, its posterior half cylindrical. Width at anus is 1 mm.

Vulva is very insignificant, just posterior to midbody. The eggs in the uteri are probably not "ripe" as they do not appear to be enclosed in a shell.

In general appearance this species resembles *S. javaensis* Micol. 1930 from the Java Sea. It differs in length, position of the excretory pore, a , β and γ values, and in the length of longest tooth; in view of the paucity of both collections it is deemed advisable to erect a new species at least until more material is available.

SYMPLOCOSTOMA LONGICOLLE Bastian

Fig. 11

Only one specimen, an immature female, was taken from among intertidal algae, Pennington Bay, Kangaroo Island.

L = 2.76 mm.; $a = 30.6$; $\beta = 3.9$; $\gamma = 13.1$; A - V = 54.7%

Width of body at head one-seventh of that at posterior end of oesophagus. Six relatively stout setae, length of each about half width of head; amphid oval, lying 5μ from anterior end, its breadth approximately a quarter that of head

width. Excretory pore one-ninth (five times depth of buccal capsule) and nerve ring a half length of oesophagus from head.

Buccal capsule 16μ long, diameter at anterior end 8μ , with five thickened rings with a circle of "rodlets" on its inner surface at level of second ring from mouth. Dorsal teeth about seven-tenths length of buccal capsule, its tip reaching between first and second rings. Pair of "lenticular" bodies just posterior to buccal capsule. No accessory teeth seen.

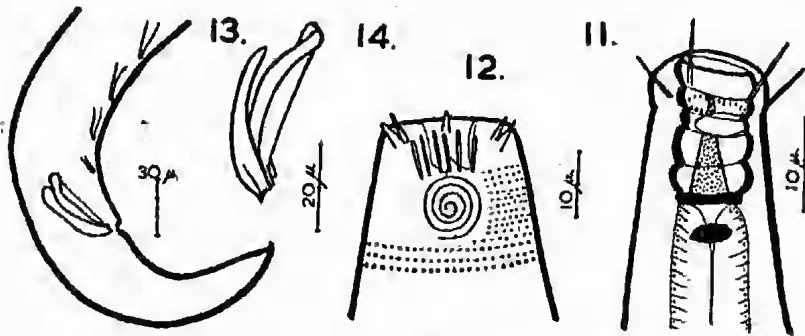


Fig. 11-14

Fig. 11, *Symplocostoma longicolle*: head. Fig. 12-14, *Harveyjohnstonia kartanum*: 12, head; 13, male tail; 14, spicules.

Ovaries reflexed, no ripe eggs. Length of tail about six times anal diameter.

This species agrees with *S. longicolle* in the characters of buccal capsule. The α , β and γ values vary somewhat from those given by Stekhoven (1935, p. 59) and 1950 (90), though α and β values agree with those of Allgen 1927, 217) for a juvenile specimen from Tasmania; the chief difference from the latter is in the position of the excretory pore, stated by Allgen to be 7.5μ from head, instead of 78μ as in our specimen. It is possible that there is an Australian and Tasmanian variety of *S. longicolle*, but in view of the immaturity of the specimens so far noted this is by no means certain.

Harveyjohnstonia n.g.

Cyatholaiminae—Cuticle without lateral differentiation, amphid spiral, buccal capsule with one small dorsal tooth, oesophagus without terminal bulb, ovaries reflexed, vulva in front of midbody, spicules alate, gubernaculum paired with spines distally, four tubular preanal organs, decreasing gradually in size from the anteriormost.

The genus is close to *Acanthonchus* and *Paracanthonchus*. It differs from both in the absence of lateral cuticular differentiation, and in the size of the buccal tooth; it differs from *Acanthonchus* also in the presence of spines on the gubernaculum (not mentioned by Cobb) and in the similarity of the preanal tubules; it further differs from *Paracanthonchus* in the length of the ribs of the buccal capsule.

Harveyjohnstonia kartanum n. sp.

Fig. 12-14

From littoral rock scrapings, Pennington Bay, Kangaroo Island.

♀ : L = 1.45; α = 20.5; β = 7.3; γ = 11.1; A - V = 45.1%

♂ : L = 1.6; α = 36; β = 8; γ = 14.5

Cuticle marked with transverse rows of punctations, in which no lateral differentiation occurs. Scattered setae present over body surface. Six short cephalic setae, their length one-sixth that of head width at this level, 22μ . Amphid spiral, of three and a half circles, its centre lying 15μ from anterior end of worm, its diameter about one-third that of head.

Buccal capsule $8-9\mu$ in diameter, its base $8-9\mu$ from anterior end of head, with about twelve ribs; tooth very small, at base of buccal capsule; diameter of head at this level 25μ .

Oesophagus without terminal bulb; nerve ring at $.1$ mm. from head (at about half length of oesophagus), at which level body diameter is 38μ ; at base of oesophagus body diameter is 50μ .

Ovaries reflexed, eggs not present.

Male tail two and half to three times anal breadth. Curved alate spicules 38μ long (about equal to anal breadth); gubernaculum paired, about three-quarters length of spicules, distal end somewhat enlarged, with several "thorns" and a posterior spine. Four tubular preanal organs, almost equidistant, anterior-most largest, others successively smaller. A few postanal setae present.

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